

# Appendix 1

## Percent Identity

	1	2	3	4	5	6	7	8	
1	■	32.0	25.4	24.8	24.9	51.4	25.6	47.9	1
2	122.6	■	26.0	25.3	24.9	34.8	25.2	31.8	2
3	146.8	127.4	■	59.8	60.2	26.4	65.0	20.9	3
4	141.2	140.1	53.3	■	77.8	25.0	55.1	21.4	4
5	145.2	138.3	51.2	21.5	■	25.4	53.1	22.5	5
6	68.2	114.3	138.1	148.6	140.5	■	27.2	52.1	6
7	149.2	135.5	42.7	63.3	65.9	132.7	■	24.2	7
8	70.6	118.0	157.3	150.5	158.9	658.7	145.0	■	8
	1	2	3	4	5	6	7	8	

Divergence

BB-1085 SEQ ID NO:10

*Chlamydomonas* PDI (GI 2708314)

Alfalfa PDI (GI 266743)

Maize PDI (GI 1709619)

Wheat PDI (GI 1709620)

*Arabidopsis* PDI (GI 9759328)

*Arabidopsis* PDI (GI 12323392)

*Arabidopsis* PDI (GI 4678297)

E

M.	10	20	30	40	50	60	Consensus #1
1	---	---	---	---	---	---	BI1085 SEQ ID NO 10
1	NRW---	NLIALTLG	---	---	---	---	Chlamydomonas PDI (GI 2708314)
1	---	---	---	---	---	---	Alfalfa PDI (GI 266743)
1	---	---	---	---	---	---	Maize PDI (GI 1709619)
1	---	---	---	---	---	---	Wheat PDI (GI 1709620)
1	---	---	---	---	---	---	Arabidopsis PDI (GI 9759328)
1	---	---	---	---	---	---	Arabidopsis (GI 12323392)
1	---	---	---	---	---	---	Arabidopsis PDI (GI 4678297)

	70	80	90	100	110	120	Consensus #1
57	-----	-----	-----	-----	-----	-----	BB1085 SEQ 3D NO 10
17	-----	-----	-----	-----	-----	-----	Chlamydomas PDI (GI 2708314)
35	-----	-----	-----	-----	-----	-----	Alfalfa PDI (GI 266743)
36	-----	-----	-----	-----	-----	-----	Maize PDI (GI 1709619)
41	-----	-----	-----	-----	-----	-----	Wheat PDI (GI 1709620)
55	-----	-----	-----	-----	-----	-----	Arabidopsis PDI (GI 9759328)
31	-----	-----	-----	-----	-----	-----	Arabidopsis PDI (GI 12303392)
55	-----	-----	-----	-----	-----	-----	Arabidopsis PDI (GI 4678297)

	130	140	150	160	170	180	Consensus #1
97	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	BB1085 SEQ 1D NO 10
60	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	DETVKSKPAL	Chlamydomonas PDI (GI 2708314)
44	HDTVKXKDFIV	HDTVKXKDFIV	HDTVKXKDFIV	HDTVKXKDFIV	HDTVKXKDFIV	HDTVKXKDFIV	Alfalfa PDI (GI 266743)
45	DEAVKXKDFIV	DEAVKXKDFIV	DEAVKXKDFIV	DEAVKXKDFIV	DEAVKXKDFIV	DEAVKXKDFIV	Maize PDI (GI 1709619)
50	DDALVNHFFIL	DDALVNHFFIL	DDALVNHFFIL	DDALVNHFFIL	DDALVNHFFIL	DDALVNHFFIL	Wheat PDI (GI 1709620)
114	TDVJENNOYAL	TDVJENNOYAL	TDVJENNOYAL	TDVJENNOYAL	TDVJENNOYAL	TDVJENNOYAL	Arabidopsis PDI (GI 9759328)
40	TEVJSKXDFIV	TEVJSKXDFIV	TEVJSKXDFIV	TEVJSKXDFIV	TEVJSKXDFIV	TEVJSKXDFIV	Arabidopsis (GI 12323392)
110	TEVJGNSXFAV	TEVJGNSXFAV	TEVJGNSXFAV	TEVJGNSXFAV	TEVJGNSXFAV	TEVJGNSXFAV	Arabidopsis PDI (GI 4678297)

	190	200	210	220	230	240	Consensus #1
.A.....	G.P.T.	Y.G.R.	IV.	K.P.			BB1085 SEQ 1D NO 10
156	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
157	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
158	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
159	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
160	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
161	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
162	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
163	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
164	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
165	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
166	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
167	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
168	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
169	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
170	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
171	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
172	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
173	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
174	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
175	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
176	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
177	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
178	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
179	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
180	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
181	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
182	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
183	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
184	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
185	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
186	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
187	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
188	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
189	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
190	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
191	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
192	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
193	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
194	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
195	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
196	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
197	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
198	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
199	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
200	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
201	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
202	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
203	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
204	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
205	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
206	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
207	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
208	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
209	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
210	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
211	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
212	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
213	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314)
214	Y	L	K	N	P	E	Chlamydomas PDI (GI 2708314

6

	250	260	270	280	290	300	Consensus #1
	.....G.....F..T.....						BB1085 SEQ ID NO 10
2213	KADAEVVVGVGFKA	EETIY	TFSYA-ARTEDVVV	TSA	AAAGL	VDTVSVVK	Chlamydomonas PDI (GI 2708314)
1173	VEDMKVVIVGVPPKE	DEEY	NFTLAEKTSDDYD	HLN	LAKH--	PXC	SSAVSGVVR
1160	IDDKLYIVGVTAEP	EETFTNTMEVAEK	SDDYDGH	LHANH--	PRC	VEEELR	Alfalfa PDI (GI 266743)
1361	-EDGKHJVGVPTSP	EETFTNLELAK	PSDYDGH	VHANH--	PROG	VEEELR	Maise PDI (GI 1709619)
1166	VSNGVVVGVPTSP	VEH	QNNKASDVV	CHLVHANH	PRC	VEEELR	Wheat PDI (GI 1709620)
2224	VGSNVVVGVPTSP	VEH	QNNKASDVV	CHLVHANH	PRC	VEEELR	Arabidopsis PDI (GI 9759328)
1256	VGSNVVVGVPTSP	VEH	QNNKASDVV	CHLVHANH	PRC	VEEELR	Arabidopsis PDI (GI 12323392)
1220	VSARELLVFGEARS	VSEGE	SRGGNS-	GGSDLS	VGASST	ESATETQV	Arabidopsis PDI (GI 4678297)

	310	320	330	340	350	360	Consensus #1
272	ATG	ATG	ATG	ATG	ATG	ATG	BB1085 SEQ ID NO 10
273	ATG	ATG	ATG	ATG	ATG	ATG	Chlamydomonas PDI (GI 2708314)
274	ATG	ATG	ATG	ATG	ATG	ATG	Alfalfa PDI (GI 266743)
275	ATG	ATG	ATG	ATG	ATG	ATG	Maize PDI (GI 1709619)
276	ATG	ATG	ATG	ATG	ATG	ATG	Wheat PDI (GI 1709620)
277	ATG	ATG	ATG	ATG	ATG	ATG	Arabidopsis PDI (GI 9759328)
278	ATG	ATG	ATG	ATG	ATG	ATG	Arabidopsis (GI 12323392)
279	ATG	ATG	ATG	ATG	ATG	ATG	Arabidopsis PDI (GI 4678237)

	370	380	390	400	410	420	Consensus #1
327	WT	ODLKADAEIMTV	R	S	K	Q	BB1085 SEQ ID NO 10
287	WT	ODLKADAEIMTV	R	S	K	Q	Chlamydomonas PDI (GI 2708314)
277	INFT	FG--GAESKTKYHY	EQY	QCGSV	DVGDVE	---	Alfalfa PDI (GI 266743)
278	LNFTSG	--PFDSKXSAYS	A	AE	Q	Q	Maize PDI (GI 1709619)
282	LNFTSG	--PFDSKXSAYG	CV	EE	S	EE	Wheat PDI (GI 1709620)
339	SVTKN	---	EE	TE	Q	Q	Arabidopsis PDI (GI 9759328)
372	VNFTGA	--TAELKSKYR	Y	ET	SN	Q	Arabidopsis (GI 12323392)
272	---	---	---	---	---	---	Arabidopsis PDI (GI 4678297)

	K	430	440	450	460	S	P	V	V	V	Consensus #1
383	GTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	BB1085 SEQ ID NO 10
345	GTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Chlamydomas PDI (GI 2708314)
335	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Alfalfa PDI (GI 266743)
333	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Maize PDI (GI 1709613)
337	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Wheat PDI (GI 1709620)
394	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Arabidopsis PDI (GI 9759328)
327	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Arabidopsis (GI 12323392)
384	CTG	ATA	ATG	ATT	ATA	ATA	ATA	ATA	ATA	ATA	Arabidopsis PDI (GI 4618297)

..V....K.V.L.E.....HC.....P.....K.D.T.N..P.....										Consensus #1									
490										540									
442	SV	L	L	L	L	L	L	L	L	KK	R	F	K	K	BB1085 SEQ ID NO 10				
405	DV	L	L	L	L	L	L	L	L	KK	R	F	K	K	Chlamydomas PDI (GI 2708314)				
389	DV	L	L	L	L	L	L	L	L	KK	R	F	K	K	Alfalfa PDI (GI 266743)				
390	DV	L	L	L	L	L	L	L	L	KK	R	F	K	K	Maize PDI (GI 1709619)				
394	DV	L	L	L	L	L	L	L	L	KK	R	F	K	K	Wheat PDI (GI 1709620)				
453	E	L	D	S	G	N	I	D	T	KK	R	F	K	K	Arabidopsis PDI (GI 9759328)				
384	DV	L	L	L	L	L	L	L	L	KK	R	F	K	K	Arabidopsis PDI (GI 12323392)				
443	E	L	D	S	G	N	I	D	T	KK	R	F	K	K	Arabidopsis PDI (GI 4678297)				
..G.P.T..F.....R.....										Consensus #1									
550										600									
500	VK	F	L	L	L	L	L	L	L	SL	K	S	T	K	BB1085 SEQ ID NO 10				
463	VK	F	L	L	L	L	L	L	L	SL	K	S	T	K	Chlamydomas PDI (GI 2708314)				
449	VQ	L	L	L	L	L	L	L	L	SL	K	S	T	K	Alfalfa PDI (GI 266743)				
449	VQ	L	L	L	L	L	L	L	L	SL	K	S	T	K	Maize PDI (GI 1709619)				
453	VQ	L	L	L	L	L	L	L	L	SL	K	S	T	K	Wheat PDI (GI 1709620)				
511	AE	F	L	L	L	L	L	L	L	SL	K	S	T	K	Arabidopsis PDI (GI 9759328)				
444	VK	F	L	L	L	L	L	L	L	SL	K	S	T	K	Arabidopsis PDI (GI 12323392)				
494	AE	F	L	L	L	L	L	L	L	SL	K	S	T	K	Arabidopsis PDI (GI 4678297)				
.....KDEL										Consensus #1									
610										620									
559	V	L	L	L	L	L	L	L	L	KK	R	F	K	K	BB1085 SEQ ID NO 10				
522	V	L	L	L	L	L	L	L	L	KK	R	F	K	K	Chlamydomas PDI (GI 2708314)				
486	KTGAH	-Q	E	V	E	Q	P	K	A	A	A	A	A	A	Alfalfa PDI (GI 266743)				
486	TAAPHHH	R	P	G	A	T	G	I	R	E	G	R	A	E	Maize PDI (GI 1709619)				
490	TAG	-Q	A	A	A	A	A	A	A	A	A	A	A	A	Wheat PDI (GI 1709620)				
570	TPKVET	T	E	T	E	K	E	S	P	D	S	T	T	T	Arabidopsis PDI (GI 9759328)				
491	VKPT	S	G	N	I	D	T	K	E	S	P	D	S	T	Arabidopsis PDI (GI 12323392)				
546	-PVI	S	T	M	K	S	D	E	-	-	-	-	-	-	Arabidopsis PDI (GI 4678297)				

Consensus #1: When all match the residue on the Consensus show the residue of the Consensus, otherwise show ''

Shade (with black at 40% fill) residues that match BB1085 SEQ ID NO 10 exactly.

E